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DT09  d PCT/PTO 27 SEP 2004

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Pertti AIMONEN et al.

Attn: PCT Branch

Application No. New U.S. National Stage of PCT/FI03/00230

Filed: September 27, 2004

Docket No.: 121037

For: METHOD FOR DETERMINING THE SCALE OF AN OBSERVATION AREA

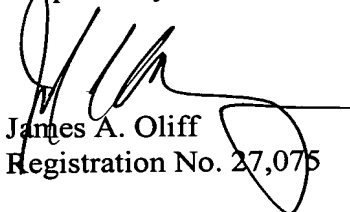
**SUBMISSION OF THE ANNEXES TO THE
INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is a submission of the annexes to the International Preliminary Examination Report (Form PCT/IPEA/409). The attached material replaces the claims.

Respectfully submitted,


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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TP102025/JUV	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI2003/000230	International filing date (day/month/year) 26-03-2003	Priority date (day/month/year) 27-03-2002
International Patent Classification (IPC) or national classification and IPC G01N 21/84		
Applicant METSO AUTOMATION OY et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 24-10-2003	Date of completion of this report 21-06-2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Gordana Ninkovic / ITW Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2003/000230

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☒ This report is based on a translation from the original language into the following language english, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☒ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-18 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 20-21 received by this Authority on 16.04.2004

pages* _____ received by this Authority on _____

☒ the drawings:

pages 1-5 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-12</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-12</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-12</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

- A) US 6040853 A (P. Delagnes et al), 21 March 2000
- B) US 4490617 A (P. W. Loose), 25 December 1984
- C) EP 1096777 A1 (Hewlett-Packard Comp.), 2 May 2001
- D) DE 3205828 A1 (Inspection Technology Inc.), 26 November 1982
- E) US 5845002 A (R. Heck et al), 1 December 1998

In a view of new claims, amended at 16-04-2004, documents A-C are reconsidered to represent the state of the art, together with remaining documents D-E.

Document A discloses a process for detecting defects on the textured surfaces e.g. web of fabric. The web is initially stored on a roller and driven by a drive roller. A fixed camera, whose optical axis makes an inclination with the portion of web of fabric, takes successive images of the web. These images are used for forming the sequences of sub-images, each of sequences being associated with an elementary portion of surface. A mathematical processing corrects the effects caused by inclination of the optical axis of the camera, giving each sub-image a standard rectangular or trapezoidal shape. (See column 3, line 22-column 4, line 3; fig.2).

Document B discloses an optical measuring system for measuring the width of the strip being rolled. It uses two cameras arranged above the strip at a known distance apart and being able of viewing the entire width of strip. To compensate for inaccuracies resulting from the imaging system, a calibration

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

of the imaging system is effected by means of a calibration grid. (See column 1, line 64-column 3, line 17; column 5, line 22-52; column 7, line 20-48).

Document C discloses also an image capture system having an electronic camera for document imaging using a calibration grid in order to correct for aberrations. (See column 7, line 28-column 8, line 54).

However, none of the cited documents discloses a method for control of the quality or the condition of a fibre web that employs several imaging measuring devices placed in successive measurement positions, the method involving calibrating the scales of the observation areas of different imaging measuring devices with one or more calibrating objects, where the scales are arranged to be comparable with each other.

In view of the cited documents such a method cannot be considered obvious to a person skilled in the art.

Therefore the invention claimed in claims 1 - 12 is novel and considered to involve an inventive step.

The claimed invention is regarded to be industrially applicable.

Claims:

1. A method in the control of the quality or the condition of a fibre web (21) on the basis of optical imaging diagnostics, wherein the fibre web (21) under examination and/or means (22, 23) relating to the processing of the fibre web, such as, for example, wires, felts, rolls, or reels, are monitored in the running direction of the fibre web with several optical imaging measuring devices (1 to N) placed in successive measurement positions, **characterized** in that the scales of the observation areas of said measuring devices (1 to N) are calibrated by means of one or more calibration objects placed in the observation area of the measuring devices, to correct the perspective error caused by the position between said measuring devices and the object (21, 22, 23) monitored by them and that the scales of the observation areas of said imaging measuring devices (1 to N) are arranged to be comparable with each other.
2. The method according to claim 1, **characterized** in that in the calibration situation, said one or more calibration objects are arranged onto or in place of the fibre web (21) and/or means (22, 23) relating to the processing of the fibre web, in the observation area of the imaging measuring device (1 to N).
3. The method according to claim 2, **characterized** in that said one or more calibration objects are formed of single point-like objects, objects resembling a measuring tape or a table, and/or net-like or square-ruled structures.
4. The method according to claim 2 or 3, **characterized** in that said one or more calibration objects are formed of a solid material.
5. The method according to claim 2 or 3, **characterized** in that said one or more calibration objects are formed of light points or lighting patterns reflected on the object.
6. The method according to any of the preceding claims, **characterized** in that the scale of the observation area of said at least one

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imaging measuring device (1 to N) is calibrated in the transverse direction of the fibre web (21).

- 5 7. The method according to any of the preceding claims, **characterized** in that the scale of the observation area of said at least one imaging measuring device (1 to N) is calibrated in the machine direction.
- 10 8. The method according to claim 1, **characterized** in that in the different measuring positions, the drying shrinkage of the fibre web (21) in the transverse direction and/or edge cutting of the fibre web (21) and/or a displacement of the fibre web (21) in the transverse direction are taken into account.
- 15 9. The method according to any of the preceding claims, **characterized** in that the imaging measuring device (1 to N) used is a camera, preferably a camera of the visible wavelength range or a thermal camera operating in the infrared range.
- 20 10. The method according to any of the preceding claims 1 to 8, **characterized** in that the imaging measuring device (1 to N) used is an imaging measuring device based on spectral resolution, for example an imaging spectrometer.
- 25 11. The method according to any of the preceding claims, **characterized** in that information recorded in an imaging manner is produced substantially over the whole production width of the fibre web (21) or on only a part of the production width of the fibre web.
- 30 12. The method according to any of the preceding claims, **characterized** in that by means of the method, information measured in an imaging manner and having a calibrated scale is subjected to automatic pattern recognition and/or image processing, to detect a defect or a phenomenon in the fibre web (21) under examination or in a means
- 35 (22, 23) relating to the processing of the fibre web.